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UNITED STATES ARMY  
HEALTH CARE STUDIES AND  
CLINICAL INVESTIGATION ACTIVITY

(2)

ANALYSIS OF CHAMPUS PER CAPITA  
MENTAL HEALTH EXPENDITURES & UTILIZATION FOR  
BENEFICIARIES LESS THAN EIGHTEEN YEARS

FORT STEWART, GA  
FORT CAMPBELL, KY  
FORT BRAGG, NC  
CATCHMENT AREAS

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STATISTICAL DATABASE PROJECT

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UNITED STATES ARMY  
HEALTH SERVICES COMMAND  
FORT SAM HOUSTON, TEXAS 78234

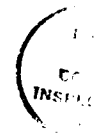


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ITEM 19 (Continued):

Prior to the demonstration project at Fort Bragg, mental health per capita expenditures for eligible beneficiaries under age 18 appeared stabilized and demonstrated only a relatively low monthly rate of increase of \$55/1000 beneficiaries. Following initiation of the demonstration project, this monthly rate of increase rose dramatically to \$812/1000 beneficiaries by the mid point of the post demonstration project period, or a 1,472% change. This rapidly escalating upward trend was also demonstrated when per capita utilization was examined.

During the same post demonstration time period Fort Stewart demonstrated no trend and at Fort Campbell mental health expenditures decreased markedly for eligible beneficiaries under 18 years. Similar trends were demonstrated by Fort Stewart and Fort Campbell when per capita utilization was examined.

## TABLE OF CONTENTS

SECTION	PAGE
DISCLAIMER. . . . .	i
REPORT DOCUMENTATION PAGE (DD Form 1473). . . . .	ii
TABLE OF CONTENTS . . . . .	iv
LIST OF TABLES. . . . .	v
LIST OF FIGURES . . . . .	vi
SECTION 1. INTRODUCTION. . . . .	1
SECTION 2. METHODS . . . . .	2
a. Data Sources . . . . .	2
b. Fiscal Intermediary Claim Procedures/Adjustments . . . . .	2
SECTION 3. RESULTS . . . . .	3
SECTION 4. SUMMARY . . . . .	5
DISTRIBUTION LIST . . . . .	16

## LIST OF TABLES

TABLES	PAGE
1 Government Psychiatric Costs Per Eligible Beneficiary Based on Date of Care FY 1988 - Jan/Feb 1991 by Month/Year Regression Results. . . . .	6
2 Government Psychiatric Costs Per Eligible Beneficiary Based on Date of Care FY 1988 - Jan/Feb 1991 by Month/Year Summary of Regression Results . . . . .	7
3 Longitudinal Trends in Prevailing Rates Georgia, Kentucky, North Carolina FY 1988 to FY 1991. . . . .	8

# LIST OF FIGURES

FIGURES	PAGE
1 Army Medical Command Government Psychiatric Costs Eligible Beneficiaries LT 18 Years Based on Date of Care FY 1988 - Feb FY 1991 by Month/Year MTF=USA Hosp Fort Stewart. . . . .	9
2 Army Medical Command Government Psychiatric Costs Eligible Beneficiaries LT 18 Years Based on Date of Care FY 1988 - Feb FY 1991 by Month/Year MTF=USA Hosp Fort Campbell . . . . .	10
3 Army Medical Command Government Psychiatric Costs Eligible Beneficiaries LT 18 Years Based on Date of Care FY 1988 - Feb FY 1991 by Month/Year MTF=USA Hosp Fort Bragg (NonLinear Model). . . . .	11
4 Army Medical Command Government Psychiatric Costs Eligible Beneficiaries LT 18 Years Based on Date of Care FY 1988 - Feb FY 1991 by Month/Year MTF=USA Hosp Fort Bragg (Linear Model) . . . . .	12
5 Army Medical Command CHAMPUS Beneficiaries in Treatment Based on Date of Care FY 1988 - Jan FY 1991 by Month/Year MTF=USA Hosp Fort Stewart. . . . .	13
6 Army Medical Command CHAMPUS Beneficiaries in Treatment Based on Date of Care FY 1988 - Jan FY 1991 by Month/Year MTF=USA Hosp Fort Campbell . . . . .	14
7 Army Medical Command CHAMPUS Beneficiaries in Treatment Based on Date of Care FY 1988 - Jan FY 1991 by Month/Year MTF=USA Hosp Fort Bragg. . . . .	15

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FORT CAMPBELL, KY  
FORT BRAGG, NC  
CATCHMENT AREAS

INTRODUCTION

This Consultant Report was performed at the request of the Coordinated Care Division of U.S. Army Health Services Command, Fort Sam Houston, TX, and the Resource Management Office of the Office of the Army Surgeon General, DC. This report is a longitudinal examination of CHAMPUS mental health per capita expenditures and utilization in three Army Medical Command catchment areas for beneficiaries less than 18 years. The overall study period was from October 1987 to February 1991. The catchment areas included Fort Bragg, NC where a child/adolescent mental health demonstration project was underway since August 1989 and two catchment areas designated as demonstration project control sites: Fort Stewart, GA and Fort Campbell, KY.

In August 1989 a mental health demonstration project was initiated at Fort Bragg by the Army Medical Department (AMEDD). The AMEDD contracted with the state of North Carolina to provide all mental health services to eligible beneficiaries under 18 years of age in the Fort Bragg catchment area. This managed care approach was implemented as an alternative to standard benefit coverage through CHAMPUS. The effects of this demonstration project on the rate of increase in government mental health per capita expenditures and utilization for eligible beneficiaries under 18 years were specifically examined in this report. The two control sites for the Fort Bragg demonstration project were the Fort Stewart and Fort Campbell catchment areas. Longitudinal per capita under age 18 mental health expenditures and utilization were also examined in these control sites and compared to Fort Bragg catchment area.

The report specifically focused on the period (October 1987-July 1989) prior to initiation of the Fort Bragg demonstration project ("pre-demonstration") and compared this period with the period beginning August 1989, following project initiation ("post demonstration") for each catchment area examined. State specific historical trends in prevailing rates were also examined to determine if expenditures required adjustment over time. Although the demonstration project was still continuing, at the time this report was published, study data were current through February 1991.



## METHODS

### Data Sources

The source of population data used in this report were the Defense Management Information System (DMIS) baseline Fiscal Years 1988 and 1989 population estimates for eligible beneficiaries under 18 years of age and DMIS Resource Analysis and Projection System (RAPS) population estimates for FY 1990 and 1991 for the same beneficiary group.

The CHAMPUS expenditures and beneficiaries receiving treatment were derived directly from CHAMPUS fiscal intermediary claims maintained by the Tri-Service CHAMPUS Statistical Database Project (TCSDB) operated by the United States Army Health Care Studies and Clinical Investigation Activity (HCSCIA), Fort Sam Houston, TX. Data included all claims adjudicated for payment through, and including February 1991.

The source of data for payments made to the state of North Carolina were data files based on the detailed expense vouchers as supplied by North Carolina and paid by the Fort Sam Houston Office of Central Contracting. These data included monthly payments made for clinical services and program overhead costs. Vanderbilt University Center for Mental Health Policy was a subcontractor to North Carolina with responsibility for demonstration project program evaluation. All payments made to Vanderbilt University for the evaluation of the demonstration project were eliminated prior to computation.

### Fiscal Intermediary Claim Procedures/Adjustments

Mental health claims paid for Department of Defense (DoD) CHAMPUS eligible beneficiaries under 18 years residing in the Fort Stewart, Fort Campbell, and Fort Bragg catchment areas were extracted from the main TCSDB database. All DoD catchment areas were determined by DMIS. A claim was determined to be mental health based on the primary ICD-9-CM diagnosis. Diagnostic selection criteria was agreed upon by HCSCIA and the Center for Mental Health Policy of Vanderbilt University prior to extraction. Following extraction, the date of care was computed for each claim and claims with a date of care through January 1991 were included. Inclusion of February 1991 data would artificially bias costs downward for Fort Stewart and Fort Campbell due to the time lag between date of care and claim payment. Claims data were then merged with both catchment area population data and North Carolina voucher payment data.

Following merging of data, fiscal intermediary claims were adjusted upward to reflect the fiscal intermediary adjudication processing charges. During the period of analysis, the states containing the catchment areas examined were served by two fiscal intermediaries; WPS of Wisconsin and Blue Cross/Blue Shield of South Carolina. The claim processing rates were as follows: FY

1987, \$7.47; FY 1988, \$7.88; FY 1989, \$5.69; FY 1990, \$5.69. All claims were adjusted to reflect these adjudication billing rates. These claim rates include direct labor, indirect labor, general administration, overhead and profit. Following this upward adjustment, mental health government expenditures were divided by the eligible beneficiary population within each catchment area for each given year and the longitudinal trends were examined.

The actual beneficiaries receiving treatment were also derived directly from the TCSDP database. Beneficiaries receiving inpatient care were defined as any beneficiary for whom either an inpatient institutional or professional service claim was paid. Similar criteria was used to define beneficiaries receiving outpatient care. Beneficiaries receiving treatment per month were computed based on date of care. Beneficiaries receiving care were divided by the beneficiary population within the catchment area and then multiplied by 1000 to express treated beneficiaries as a ratio per 1000 population. These utilization ratios were also displayed longitudinally.

## RESULTS

Each catchment area was analyzed using regression analysis to include tests for both a linear and nonlinear relationship of per capita mental health expenditures over time. These data were also examined for seasonal trends. Per capita expenditure plots of each catchment area are presented in Figures 1 to 4. Plots of total inpatient and outpatient beneficiaries receiving treatment per month are presented in Figures 5 to 7. Figures 2 to 4 also include the trend predicted by regression analysis. Detailed regression results are presented in Table 1 and a summary of regression results is presented in Table 2.

### Fort Stewart:

The mean government mental health per capita expenditure from October 1987 to January 1991 was \$14.41 and ranged from \$6.65 to \$23.11 per beneficiary (Figure 1). The mean inpatient beneficiaries receiving treatment per eligible population during the same time period were 1.7/1000 (range: 0.9 to 2.5/1000), while for outpatient beneficiaries the ratio was 6.4/1000 (range: 3.9 to 9.6/1000) (Figure 5). Fort Stewart presented no significant positive or negative trends in either mental health per capita expenditures or treated beneficiaries during this same period. The lack of a significant trend in expenditures persisted when examined with both linear and nonlinear regression analysis (Table 1). Although Fort Stewart did demonstrate a seasonal trend in per capita expenditures, when adjustments for seasonal effects were made there remained no significant trend. Subsequently, no increase was demonstrated by Fort Stewart during either the pre-demonstration (October 1987-July 1989) or the post demonstration (August 1989-January 1991) periods (Table 2).

## Fort Campbell:

During the pre-demonstration period the mean mental health per capita expenditure was \$17.36 and ranged from \$10.83 to \$25.28. During the post demonstration period the mean was \$15.88 and ranged from \$6.83 to \$25.89 (Figure 2). Fort Stewart demonstrated a significant strong nonlinear trend in government mental health expenditures during the study period (Table 1) and a seasonal trend was marginally significant. More importantly, during the Fort Bragg pre-demonstration period, Fort Campbell demonstrated a monthly rate of increase of \$340 per 1000 beneficiaries. In contrast, during the post demonstration period a monthly rate of decrease of \$680 per 1000 beneficiaries was demonstrated by Fort Campbell. Figure 2 presents both the actual cost per beneficiary as well as the cost per beneficiary predicted from regression analysis. The decrease in per capita expenditures during the post demonstration was due to the decreasing beneficiaries receiving inpatient during this period. Figure 6 demonstrates a sustained decline in beneficiaries receiving inpatient beginning in early 1989 through the end of the overall study period.

## Fort Bragg:

During the pre-demonstration period (October 1987 to July 1989) the mean mental health per capita expenditure was \$9.57 and ranged from \$6.57 to \$13.15 (Figures 3,4). During the post demonstration period the per capita mean was \$17.80 and ranged from \$5.97 to \$34.75. Fort Bragg demonstrated a significant, strong and sustained upward trend in expenditures following the initiation of the demonstration project. The significance of this trend was demonstrated with both linear and nonlinear regression. Of the two predictive approaches, nonlinear regression produced a substantially superior reflection of the observed trend (Table 1). A seasonal trend was again not significant. Based on nonlinear regression, at the mid point of the pre-demonstration period Fort Bragg demonstrated a monthly rate of increase of \$55 per 1000 beneficiaries. By the mid point of the post demonstration period the monthly rate of increase had risen to \$812 per 1000 beneficiaries, or a 1,472% increase in the rate of monthly increase. By the end of the post demonstration period the rate of monthly increase had risen to \$1,046. When linear regression was used a more conservative pre- to post demonstration period rate increase of 843% was demonstrated. Figures 3 and 4 present both the actual cost per beneficiary as well as the predicted cost per beneficiary when using both nonlinear and linear regression. This rapidly escalating upward trend was also demonstrated for outpatient beneficiaries receiving treatment (Figure 7). By the end of available claims (June 1990) outpatient beneficiaries receiving treatment reached 9.3/1000. This level of utilization represented a 69% increase over outpatient utilization at the initiation of the demonstration project.

## Prevailing Rate Trends

Trends were examined in state specific prevailing rates to determine whether it would be appropriate to adjust per capita expenditures. If prevailing rates changes from FY 1988 to FY 1991 were found to be large then adjustment would be necessary to express per capita trends in constant year dollars. In addition, if large differences were demonstrated between the catchment areas then adjustment would also be indicated.

Examination was made of CHAMPUS prevailing rates for the top 20 professional service procedures performed in the three catchment areas during the study period. These procedures accounted for approximately 88% of all professional workload in these three catchment areas (Table 3). State specific prevailing rates were determined for each site utilizing CHAMPUS prevailing rate files for the states of Georgia, Kentucky, and North Carolina. Using FY 1988 as a baseline, state specific rates were determined for each procedure in both FY 1989 and FY 1990 and these rates were then divided by the FY 1988 baseline rates. Computed changes are presented at the bottom of Table 3. From FY 1988 to FY 1990 prevailing rates only increased from 2% to 4% over the FY 1988 baseline rates. Based on the marginal increase in prevailing rates, expenditures were not adjusted. If adjustments were made the effect would only be a slight decrease in expenditures in FY 1989 and FY 1990.

## SUMMARY

Prior to the child/adolescent mental health demonstration project at Fort Bragg, mental health per capita expenditures for eligible beneficiaries under age 18 appeared well stabilized and demonstrated only a relatively low monthly rate of increase (\$55/1000 beneficiaries). This general trend was also demonstrated when per capita utilization was examined. Following initiation of the demonstration project, this monthly rate of increase rose dramatically to \$812/1000 beneficiaries by the mid point of the post demonstration project period, or a 1,472% change. In contrast, during the same post demonstration time period the control site of Fort Stewart demonstrated no trend and in the case of Fort Campbell mental health expenditures decreased markedly due at least in part to decreasing inpatient utilization. An increase in prevailing rates as a partial explanation for the increases produced by the Fort Bragg demonstration project is not supported due the relatively small growth seen in these prevailing rates between FY 1988 and FY 1990, including rates for North Carolina.

TABLE 1  
GOVERNMENT PSYCHIATRIC COSTS  
PER ELIGIBLE BENEFICIARY  
BASED ON DATE OF CARE  
FY 88 - JAN/FEB 91 BY MONTH/YEAR

REGRESSION RESULTS

NONLINEAR MODEL

	N	INTERCEPT	DATE	(DATE) <sup>2</sup>	R <sup>2</sup>	P VALUE
FT STEWART 8710 - 9101	40	-582.30	.1114	-.0000052	.03	.674
FT CAMPBELL 8710 - 9101	40	-3133.42	.5922	-.000028	.56	.001
FT BRAGG 8710 - 9102	41	2264.79	-.4334	.000021	.71	.001

LINEAR MODEL

	N	INTERCEPT	DATE	R <sup>2</sup>	P VALUE
FT STEWART 8710 - 9101	40	15.04	-.000059	.00	.945
FT CAMPBELL 8710 - 9101	40	63.15	-.0043	.08	.035
FT BRAGG PRE-DEMO 8710 - 8907	22	- 31.28	.0019	.12	.059
FT BRAGG POST DEMO 8908 - 9102	19	-3 56.05	.0337	.61	.001

TABLE 2  
GOVERNMENT PSYCHIATRIC COSTS  
PER ELIGIBLE BENEFICIARIES  
BASED ON DATE OF CARE  
FY 88 - JAN/FEB 91 BY MONTH/YEAR

SUMMARY OF REGRESSION RESULTS  
RATE OF INCREASE/DECREASE PER MONTH  
(PER 1000 ELIGIBLE BENEFICIARIES)

	PRE-DEMO <sup>d</sup> ( < 8907 ) MID POINT (8808-8809)	POST DEMO <sup>d</sup> ( > 8907 ) MID POINT (8908-8909)	PRE->POST CHANGE AT MID POINTS
FT STEWART*, <sup>a,b</sup>	NO INCREASE	NO INCREASE	NO CHANGE
FT CAMPBELL*, <sup>b</sup>	+ \$340	- \$680	DECREASE
FT BRAGG*, <sup>c</sup>	+ \$55	+ \$812 <sup>e,f</sup>	1,472% INCREASE
FT BRAGG**, <sup>c</sup>	+ \$120	+ \$1,012 <sup>e</sup>	843% INCREASE

Notes:

\*Nonlinear regression model.

\*\*Linear regression model.

<sup>a</sup>No change was demonstrated regardless of model used.

<sup>b</sup>Period of analysis: 8710 to 9101.

<sup>c</sup>Period of analysis: 8710 to 9102.

<sup>d</sup>Computed at mid point of period interval.

<sup>e</sup>Excludes additional \$956,485 (8911 to 9102) paid to Vanderbilt University for demonstration project evaluation.

<sup>f</sup>Rate of increase was \$1,046/1000 beneficiaries at end of post demonstration project period.

TABLE 3  
LONGITUDINAL TRENDS IN PREVAILING RATES  
FY 88 - FY 91

PROCEDURES EXAMINED - PART 1

CODE	SHORT TITLE	PROCEDURES	PCT
90844	INDIVIDUAL PSYCHOTHERAPY	35,063	31.8
90801	DIAGNOSTIC INTERVIEW	6,939	6.3
90817	FAMILY PSYCHO; 61-90 MIN	6,445	5.8
90843	INDIVIDUAL PSYCHOTHERAPY	5,512	5.0
90815	FAMILY PSYCHO 45-60 MIN	5,315	4.8
90250	HOSPITAL VISIT, LIMITED	5,305	4.8
90260	HOSPITAL VISIT, INTER	4,386	4.0
90830	PSYCHOLOGICAL TESTING	3,793	3.4
90810	GROUP PSYCHO 61-90 MIN	3,150	2.9
90887	CONSULTATION WITH FAMILY	3,121	2.8
90825	EVALUATION OF TESTS/RECORDS	2,700	2.4
90862	PHARMACOLOGY MANAGEMENT	2,340	2.1
90814	FAMILY PSYCHO 61-90 MIN	2,214	2.0
90811	GROUP PSYCHO 45-60 MIN	2,059	1.9
90812	FAMILY PSYCHO 45-60 MIN	2,017	1.8
90280	HOSPITAL VISIT, COMPREH	1,505	1.4
90220	HOSPITAL CARE, NEW, COMPREH	1,466	1.3
90050	OFFICE/OP VISIT, EST, LTD	1,110	1.0
90070	OFFICE/OP VISIT, EST, INTER	1,099	1.0
90060	OFFICE/OP VISIT, EST, EXTEND	913	.8

WEIGHTED PREVAILING RATE TRENDS - PART 2

	FY 1988*	FY 1989	FY 1990
GEORGIA	1.0	1.0	1.02
KENTUCKY	1.0	1.01	1.02
NORTH CAROLINA	1.0	1.01	1.04

Note:

\*Baseline year for computation.

FIGURE 1

ARMY MEDICAL COMMAND  
GOVERNMENT PSYCHIATRIC COSTS  
ELIGIBLE BENEFICIARIES LT 18 YEARS  
BASED ON DATE OF CARE  
FY 1988 - JAN FY 1991 BY MONTH/YEAR

MTF=USA HOSP FT STEWART

COST PER BENEFICIARY\*TRT YR/MTH SYMBOL=\*

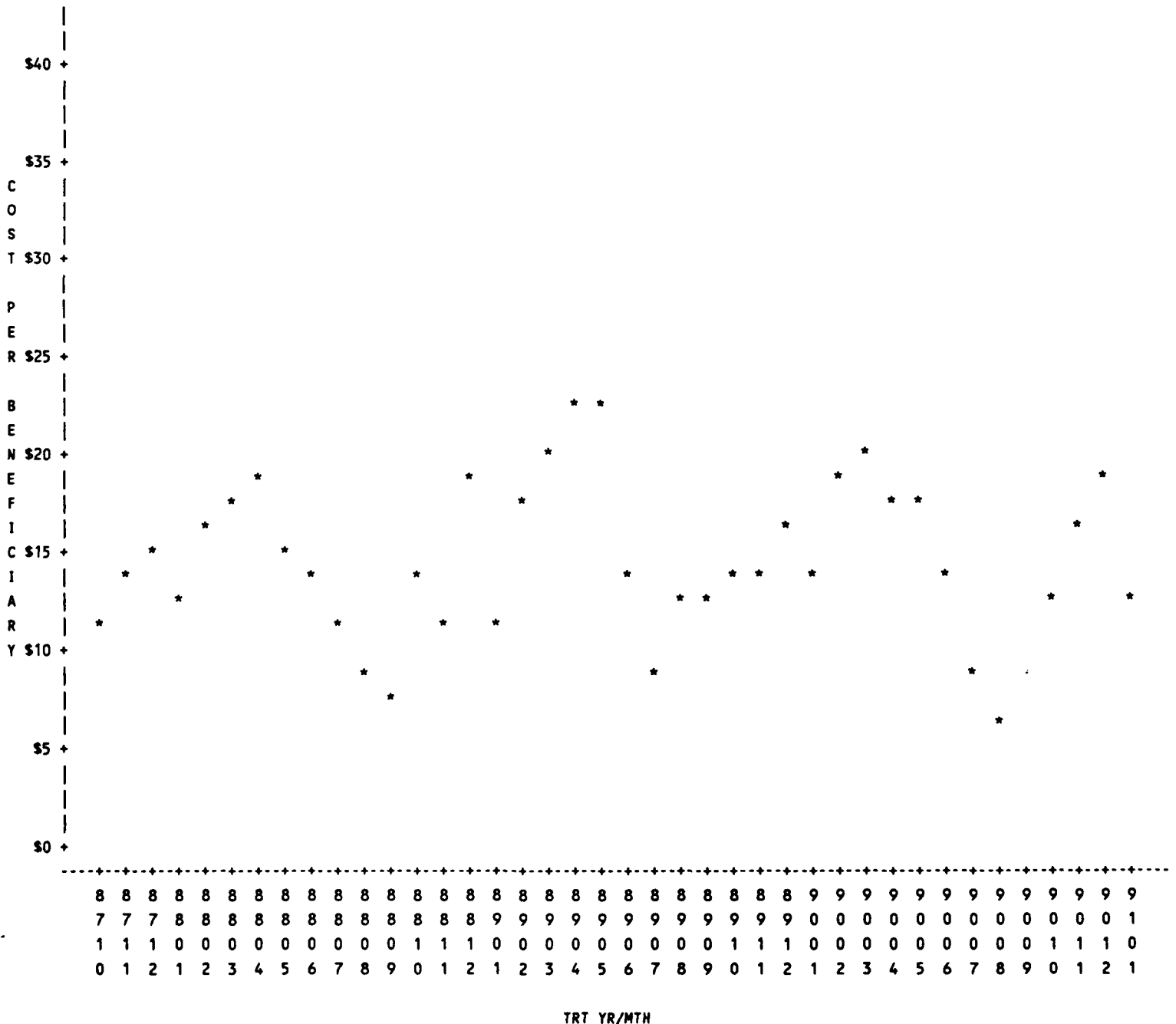




FIGURE 2

ARMY MEDICAL COMMAND  
GOVERNMENT PSYCHIATRIC COSTS  
ELIGIBLE BENEFICIARIES LT 18 YEARS  
BASED ON DATE OF CARE  
FY 1988 - JAN FY 1991 BY MONTH/YEAR

MTF=BLANCHFIELD AH FT CAMPBELL

COST PER BENEFICIARY\*TRT YR/MTH SYMBOL=\*  
PREDICTED COST\*TRT YR/MTH SYMBOL=P (NON-LINEAR MODEL)

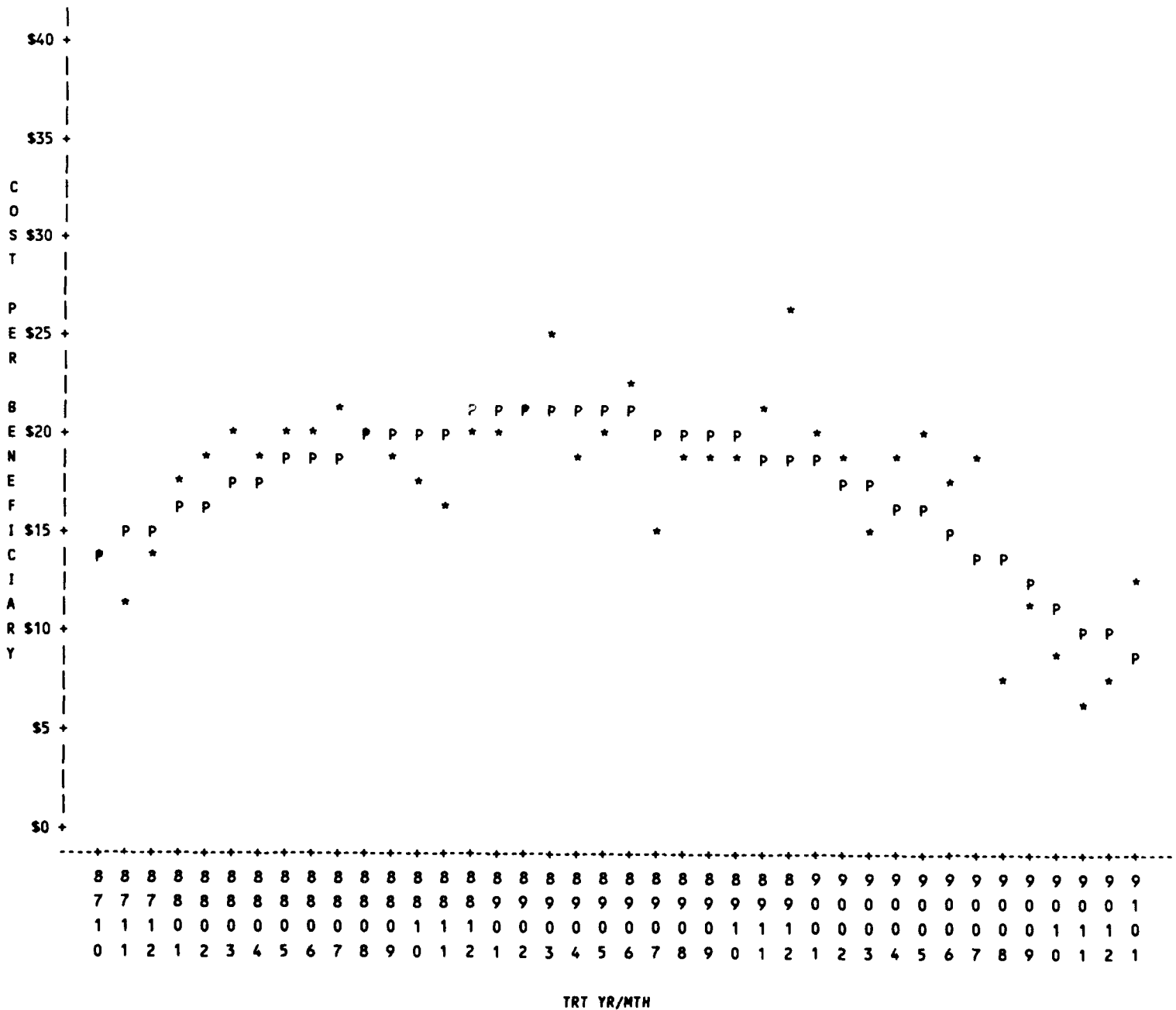


FIGURE 3

ARMY MEDICAL COMMAND  
GOVERNMENT PSYCHIATRIC COSTS  
ELIGIBLE BENEFICIARIES LT 18 YEARS  
BASED ON DATE OF CARE  
FY 1988 - FEB FY 1991 BY MONTH/YEAR

MTF=WOMACK AH FT BRAGG

COST PER BENEFICIARY\*TRT YR/MTH SYMBOL=\*  
PREDICTED COST\*TRT YR/MTH SYMBOL=P (NON-LINEAR MODEL)

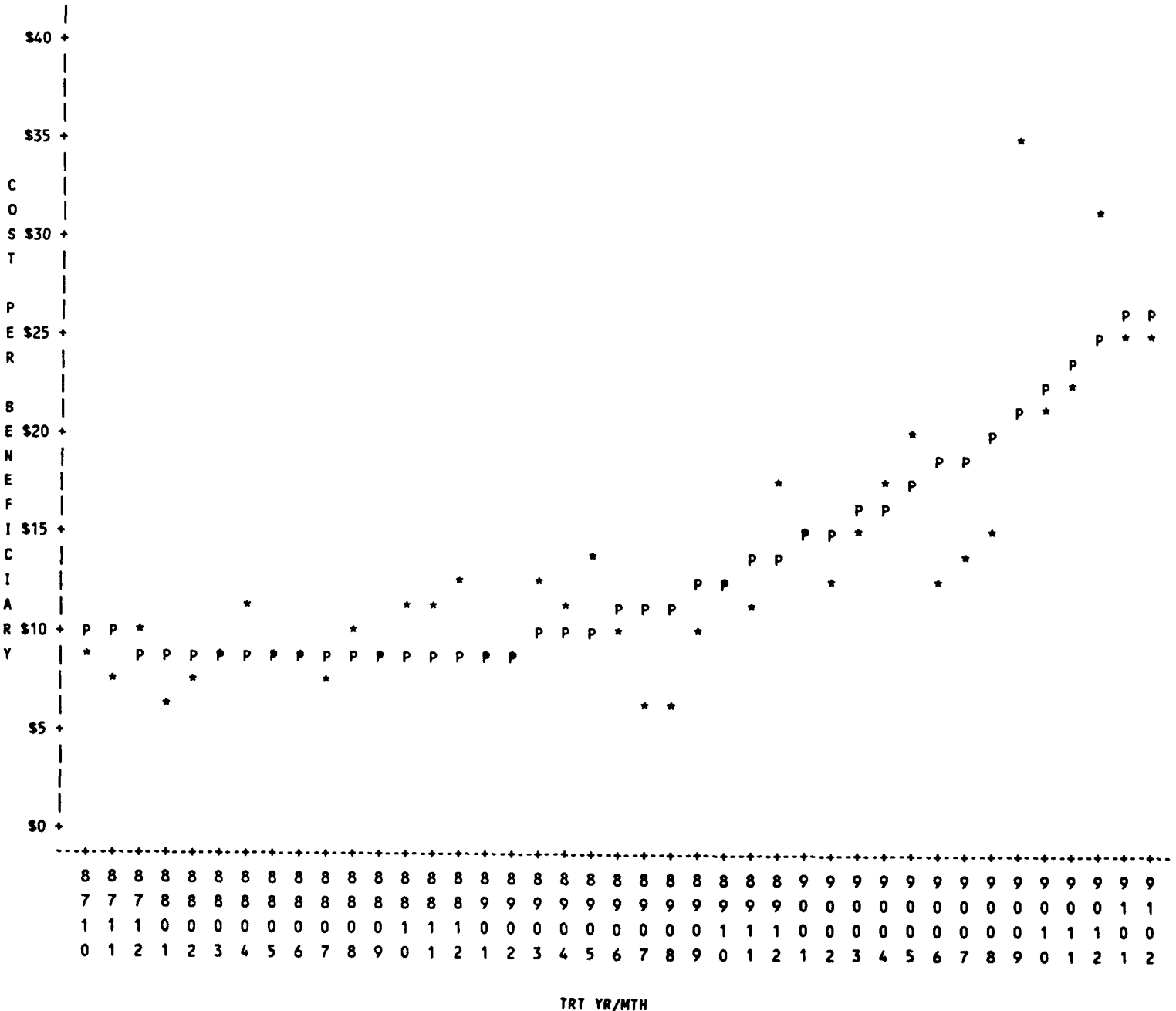


FIGURE 4

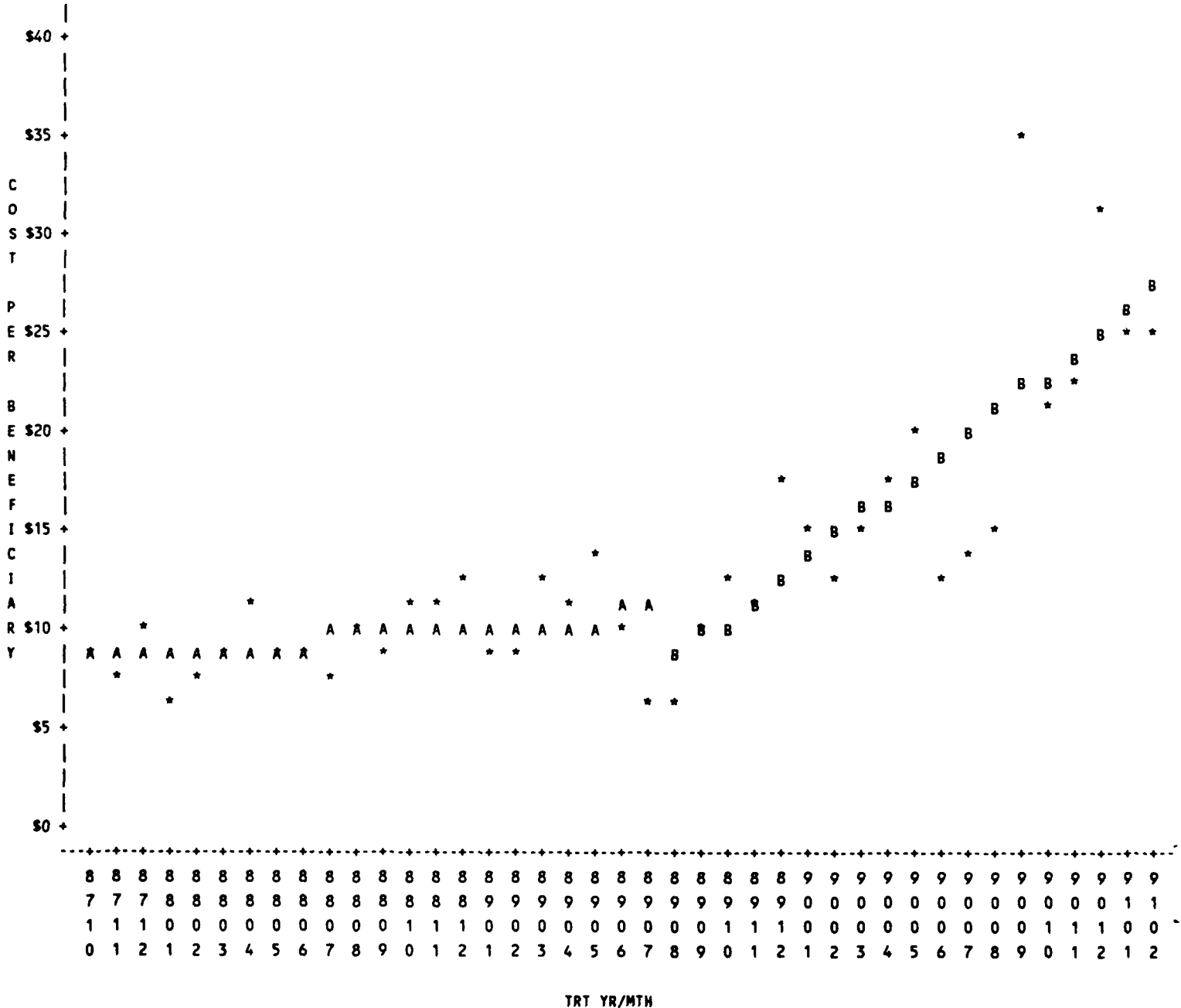
ARMY MEDICAL COMMAND  
GOVERNMENT PSYCHIATRIC COSTS  
ELIGIBLE BENEFICIARIES LT 13 YEARS  
BASED ON DATE OF CARE  
FY 1988 - FEB FY 1991 BY MONTH/YEAR

MTF=WOMACK AH FT BRAGG

COST PER BENEFICIARY\*TRT YR/MTH SYMBOL=\*

(LINEAR 2 EQUATION MODEL)

PREDICTED COST\*TRT YR/MTH; PERIODS: PRE-DEMO=A POST-DEMO=B



ARMY MEDICAL COMMAND  
CHAMPUS BENEFICIARIES IN TREATMENT  
BASED ON DATE OF CARE  
FY 1988 - JAN FY 1991 BY MONTH/YEAR

INPATIENT BENEFICIARIES\*TRT YR/MTH SYMBOL=I  
OUTPATIENT BENEFICIARIES\*TRT YR/MTH SYMBOL=O

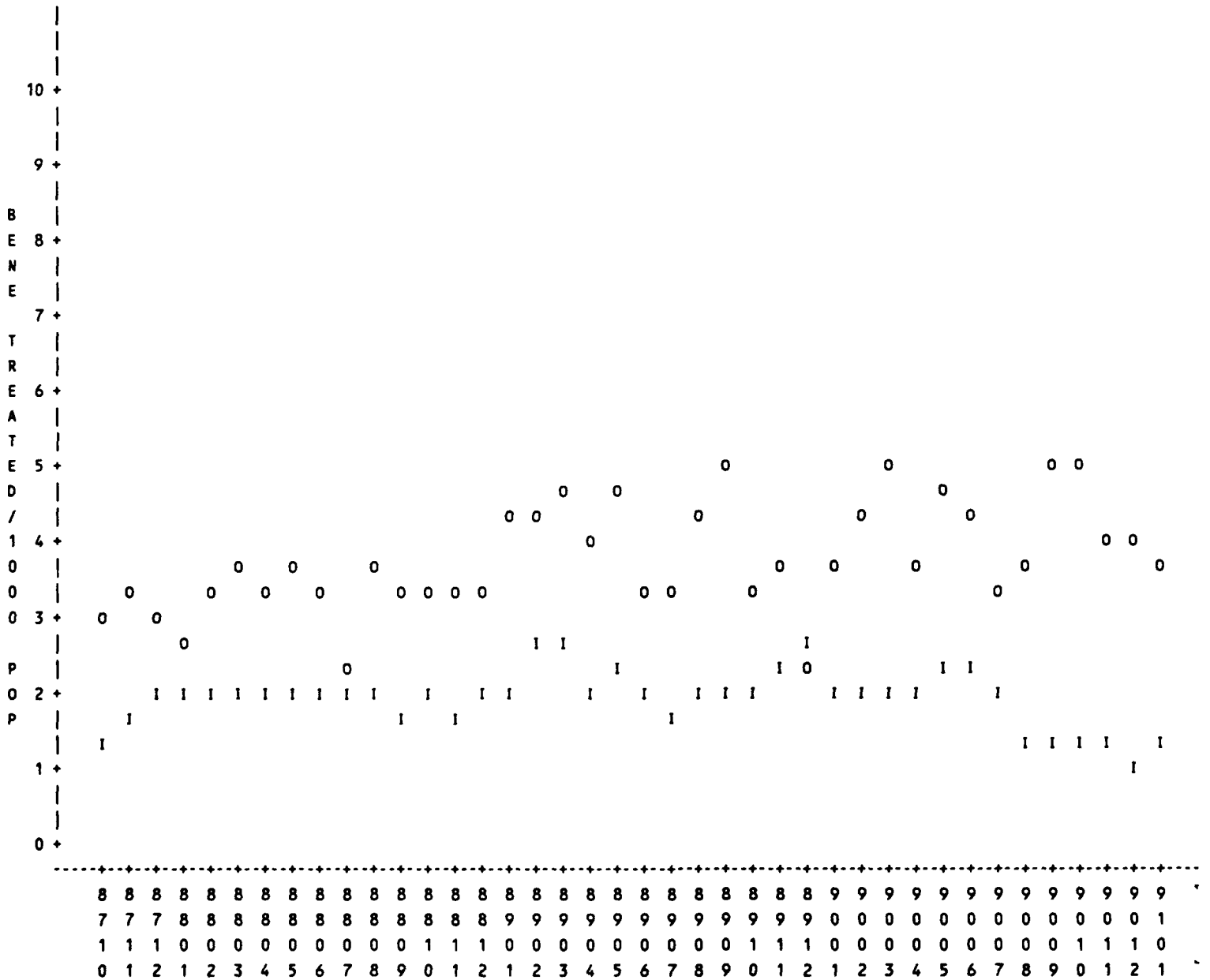


FIGURE 6

ARMY MEDICAL COMMAND  
CHAMPUS BENEFICIARIES IN TREATMENT  
BASED ON DATE OF CARE  
FY 1988 - JAN FY 1991 BY MONTH/YEAR

MTF=BLANCHFIELD AH FT CAMPBELL

INPATIENT BENEFICIARIES\*TRT YR/MTH SYMBOL=I  
OUTPATIENT BENEFICIARIES\*TRT YR/MTH SYMBOL=O



TRT YR/MTH

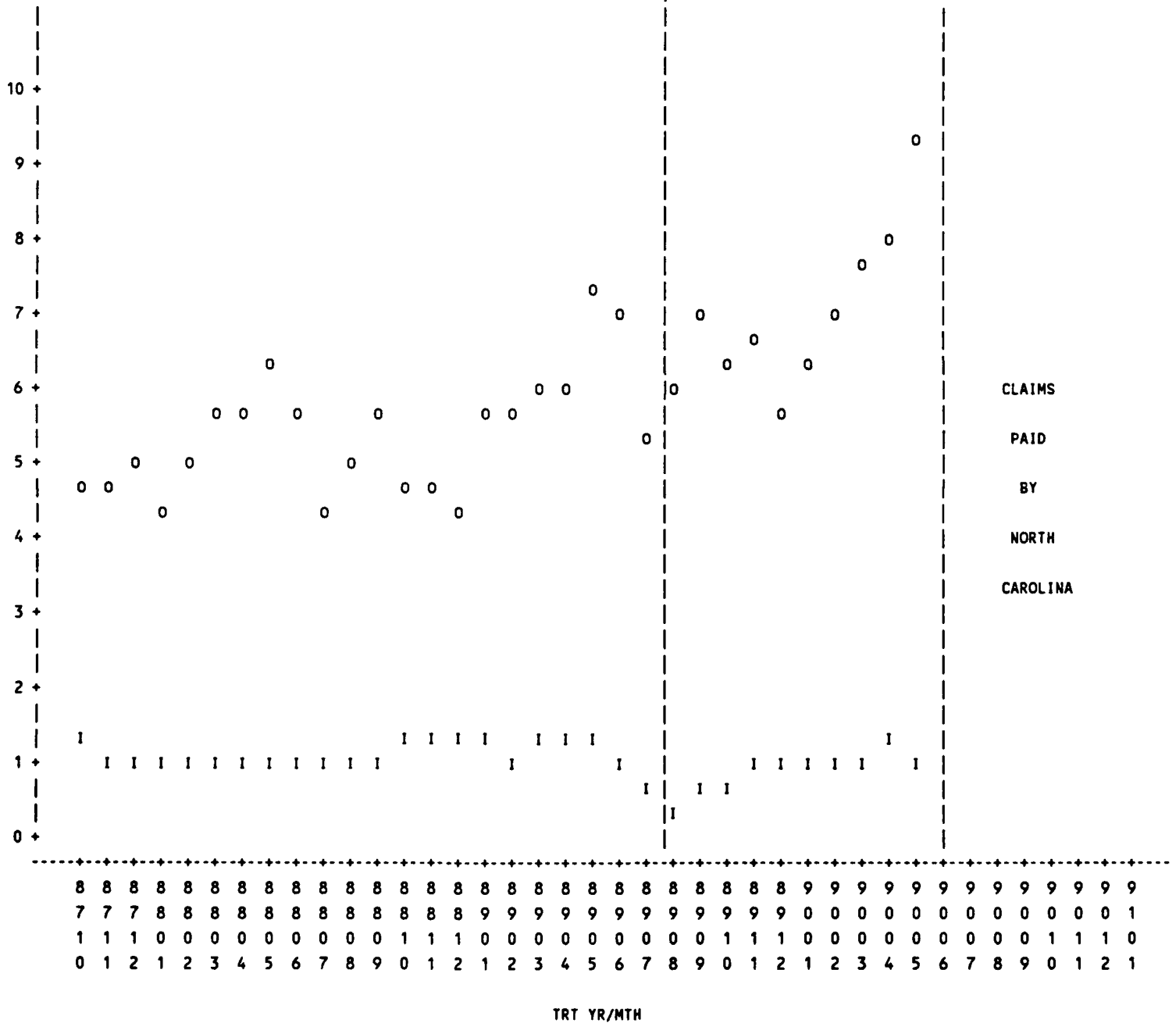
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